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## MEASURES OF DISTRIBUTION.

BY GEORGE K. HOLMES.

The problem that is the subject of this paper is to find a measure of distribution by which to establish a mathematical comparison of one group of persons with another in respect to the distribution of wealth. The aim is not to determine an individual's place in a group, nor to pay any attention to deviations from the mean. Individuals are to be out of mind, and attention is to be given to the group as a whole in relation to the mass of wealth which is possessed by it, or by a portion of it. The scheme would be inapplicable to an inquiry as to the distribution of black eyes or hereditary traits, but, it is hoped, will answer such a question as this, if statistics of all individual wealth holdings were at hand: "Is wealth more widely, evenly, and generously distributed in Massachusetts than in New York?"

The need of a precise measure of distribution applicable to wealth holdings first led to my study of the matter in 1884, when a scheme was devised that was submitted to the Massachusetts Bureau of Statistics of Labor in 1886. Since then, however, the publication of some of the results of an investigation of the distribution of wealth have been delayed, owing to the necessary priority of publication due to the results of the state census of 1885. The publication of this article, previous to the time when the measure of distribution that it describes may possibly be used by the Massachusetts Bureau, is with the permission of the Hon. Horace G. Wadlin, Chief of the Bureau.

Suppose that in a group of 100 persons — men, women, and children — fifteen persons each own wealth sufficient in amount to be worthy of consideration. One of these persons is worth \$2000; two, \$3000 each; ten, \$5000 each; and two

\$8500 each. In another group of 75 persons, nine persons own wealth, one of them being worth \$2000; four, \$3000 each; three, \$4000 each; and one, \$5000. As simple as these conditions are the character of the distribution of wealth in one of these groups cannot at a glance be compared with the character of the distribution in the other, and the problem is vastly more complicated to the observer who views large societies of millions of individuals.

The question is not fully answered by saying that in the first group the average holding of each of the 100 persons is \$750, and in the second \$413 for each of the 75 persons; nor by saying that the average holding for each of the fifteen wealth owners in the first group is \$5000, and in the second group of nine wealth owners \$3444. To rely solely upon an average would be a glaring misuse of it, since the average may be nearly the same in different groups of persons among whom wealth is very differently distributed. A million dollars may be so distributed among five owners that four of them own \$1000 apiece and one of them the remainder: or so distributed that one of them owns \$100,000; two, \$150,000 apiece; and two, \$300,000 apiece. The difference in unevenness of distribution is at once apparent, although the average wealth for each owner is \$200,000 in each group.

Nor is it sufficient to say that a certain proportion of the wealth owners own a certain proportion of the wealth, as, for instance, that one-third of the wealth owners in the group first mentioned own 43 per cent of the total wealth, and in the second group 42 per cent; because, as is the fact in these cases, the wealth may be more evenly diffused in the group in which the stated proportion of owners own the larger proportion of the wealth. The character of the comparison that may be made between results obtained in this way may depend upon the fraction of the members of the groups for whose wealth the fractional proportion of the total wealth of the group is ascertained. In some cases the relativity of the fractions of total wealth may be reversed if the adopted frac-

tion of the owners is one-tenth or some other fraction, instead of one-third or some other fraction, while the evenness or inequality of the distribution remains the same in the groups.

Since wealth as well as individuals must be taken into account, the first step is to separate wealth owners from non-owners. There is no distribution among those who do not own wealth; but, at the same time, social condition, so far as it depends upon the ownership of wealth, demands a distinct recognition of that proportion of the people who own none. This is expressed by a percentage. In some selected state 15 per cent of the people may have owned wealth in 1880 and 20 per cent in 1890. This definitely indicates an increase in the width of distribution.

The wealth owners are now set apart for further consideration. The aggregate of wealth may be mostly in the hands of the few or of the many, and it must be known how much wealth each owner possesses. If the same amount is owned by each person, there is equality of distribution; if a few, comparatively, have very large holdings and the many have small holdings, there is great inequality of distribution. It becomes necessary then to represent the number of wealth owners in a table in the common orderly arrangement, together with the amount of wealth possessed by each owner or class of owners. This arrangement is on a progressive scale, with the poorest person, or class, at one extreme, and the richest person, or class, at the other. Upon experimenting with such a tabulation it will be noticed that groups of wealth owners may be represented by five distinct types of arrangement, as shown in Tables I and II on following page.

It is requested that attention may first be confined to the arrangement of the number of owners in Table I. The peculiarities of the five types of groups of wealth owners in regard to their distribution under the progressive scale of classification appear at sight. In Type 1 the numbers are massed among the middle classes with uniform decrease from the middle class toward the extremes. In Type 2 the num-

TABLE I.

Classification of Owners.	Type 1.		Type 2.		Type 3.		Type 4.		Type 5.	
	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.
\$1	1	\$1	1	\$1	15	\$15	2	\$2	8	\$8
2	2	4	2	4	14	28	2	4	7	14
3	3	9	3	9	13	39	2	6	6	18
4	4	16	4	16	12	48	2	8	5	20
5	5	25	5	25	11 $\frac{6}{5}$	55	2	10	4	20
6	6	36	6	36	10	60	2	12	3	18
7	7	49	7	49	9	63	2	14	2	14
8	8 $\frac{4}{4}$	64	8	64	8	64 $\frac{32}{32}$	2 $\frac{1}{1}$	16	1 $\frac{1-2}{1-2}$	8
9	7	63 $\frac{52}{11}$	9	81	7	63	2	18	2	18
10	6	60	10	100	6	60	2	20	3	30
11	5	55	11 $\frac{5}{6}$	121	5	55	2	22 $\frac{10}{12}$	4	44
12	4	48	12	144 $\frac{114}{30}$	4	48	2	24	5	60
13	3	39	13	169	3	39	2	26	6	78 $\frac{12}{66}$
14	2	28	14	196	2	28	2	28	7	98
15	1	15	15	225	1	15	2	30	8	120

TABLE II.  
MEASURES OF DISTRIBUTION.

Description.	Type 1.	Type 2.	Type 3.	Type 4.	Type 5.
Median for amount.....	\$9.82 $\frac{34}{63}$	\$12.79 $\frac{1}{6}$	\$8.50	\$11.45 $\frac{5}{11}$	\$13.15 $\frac{5}{13}$
" " number.....	8.50	11.45 $\frac{5}{11}$	5.54 $\frac{6}{11}$	8.50	8.50
Difference.....	1.32 $\frac{34}{63}$	1.33 $\frac{47}{66}$	2.95 $\frac{5}{11}$	2.95 $\frac{5}{11}$	4.65 $\frac{5}{13}$
Percentage of owners of population.....	23	17	18	15	12
Average holding.....	\$8.00	\$10.33 $\frac{1}{3}$	\$5.66 $\frac{2}{3}$	\$8.00	\$8.00

bers uniformly increase from the smallest extreme to the largest, and in Type 3 the reverse is true. There is an equal distribution of numbers among the classes of Type 4. Type 5 is the reverse of Type 1, and its numbers uniformly increase from the middle to the extremes. That any existing group

of wealth owners would present so uniform an arrangement as one of these it cannot be supposed, but it must do so with more or less approximation. These uniform arrangements are adopted for bringing out more clearly the principle that follows.

Upon directing attention to the amounts of wealth owned by the classes of owners, it will be noticed that they are not always so uniformly distributed as the numbers of owners are; and, although progressions are apparent, they are stronger for amount of wealth than for number of owners. The reason for this is the multiplication of number of owners into a progressive scale. By adding one person to the class of owners of \$12, not \$1 but \$12 is added to the amount of wealth owned by this class; and by adding one person to the class of owners of \$2, only \$2 is added to the amount of wealth owned by the same class. Hence it is necessary to take account of wealth as well as of the number of its owners in comparing the evenness or inequality of the distribution of their wealth; and, in comparing two or more groups of wealth owners, it follows that to the extent that the greater proportion of the total mass of the wealth of a group of owners is owned by the smaller proportion (not the same proportion) of the total number of owners its distribution is the more unequal; and to the extent that the greater proportion of the total mass of wealth is owned by the greater proportion of the owners it is the more evenly distributed. It is now more apparent than before that to say that an arbitrarily selected fraction of the members of a group of wealth owners own a certain fraction of the group's wealth does not meet the requirements of the problem. This method is so commonly employed that it is again referred to.

Again, it follows that to the extent that the greater proportion of the mass of the total number of owners occupy a place in the scale of classification approaching the place in the scale occupied by the greater proportion of the mass of the wealth owned the distribution is the more equal. What

is required, then, is the finding of the places in the scale of classification occupied by the greater proportion of the total number of owners, and of the total amount of the wealth owned by the whole group; or, if the distribution is very uneven, the finding of the places in the scale where a mass of owners from one extreme meets an equal mass of owners from the other extreme, and the same result for the amount of wealth owned. Such, indeed, is practically the requirement, whatever the inequality or evenness of the distribution may be.

This is accomplished by finding the medians for number of owners and amount of wealth, and the measure of the distance between the medians is the measure of the inequality of distribution. If one person be added to the class of persons owning \$1, the same amount is added to the amount of wealth owned by this class, and if one person is added to the class of persons possessing \$15, \$15 is added to the wealth of this class; the median for number of owners is not disturbed thereby, but the median for amount is shifted toward the higher extreme and away from the median for number; the distribution has become more unequal and the measure increased.

Application of this principle has been made to the five types of arrangement presented in Table I. (See Table II.) In Type 1 the median for number is \$8.50; that is, the mathematical place of the median in the scale of classification is \$8.50, although there is no person possessing this amount. There are 64 persons in this group of owners, and half of these are on each side of the median. This divides the class of eight persons, each of whom owns wealth worth \$8, so that half of their number, or 50 per cent, is on each side of the median. The four persons, or 50 per cent, on the poorer side of the median in this class are represented in the scale by a corresponding mathematical place, which is \$8 plus, not 50 per cent of \$8, but 50 per cent of the class as a unit; that is, the median is at a place in the scale where the actual holding

is \$8, with 50 per cent of the class on either side, so that \$8.50 represents not only the class where the median is found, but also the place in its class.

In like manner the median for amount of wealth in Type 1 is mathematically placed where 52.63 of the wealth in the class of owners possessing \$9 each is on the poorer side of the median and where 11.63 is on the richer side.

The pair of medians for each of the five types will be found in the table of "Measures of Distribution," and also the differences between them; the larger the difference the greater being the inequality of distribution. A comparison of these differences reduces the five types of arrangement to three distinct degrees of inequality of distribution, and suggests a further examination of the five arrangements. It will now be noticed that, while there are five types of arrangement, there are but three distinct degrees of distribution, owing to the fact that, the columns for number and amount both being taken into consideration, Types 1 and 2 are almost alike, and that the same is true of Types 3 and 4. There is a massing of number and amount in very nearly the same region in each of Types 1 and 2. The massing of number in Type 3 and of amount in Type 4 is at one end of the scale, while the median for amount in Type 3 and for number in Type 4 is the same. In Type 5 the massing of the number of wealth owners at the two extremes of the scale necessarily masses the wealth at the richer extreme and makes a distinct degree of distribution, which is the most unequal of all, because the two masses of number of owners balance each other at the middle of the scale, and do not permit their resultant median to approach the greater mass of wealth found at the richer end of the scale in the column for amount.

The smaller the number representing the measure the more even the distribution. Therefore, in a group of wealth owners the more even distribution is found if the middle class is more prominent than the poorer class on one side and the richer class on the other, or if the richer class is more promi-

nent than the middle class and the latter is more prominent than the poorer class. The more unequal distribution is found if the richer and poorer classes are each more prominent than the middle class. An intermediate degree of distribution is found if the poorer class is more prominent than the middle class and that is more prominent than the richer class, or if the three classes have no prominence over one another.

It may be supposed that the wealth owners of Massachusetts do not approximately fall into the arrangement of Type 5, nor of Type 4, nor of Type 2, nor of Type 1; until statistics shall decide, it is probable that they are represented by some variation of Type 3, the degree of this type's distribution not being distinctively even nor uneven.

Having determined the proportions of owners of wealth and non-owners in a social group, and the degree of evenness or unevenness with which wealth is distributed among the owners, we need to determine what the character of the distribution is in still another respect. Two social groups may have substantially the same proportion of wealth owners among whom wealth is distributed with substantially the same evenness, and yet the relationship of the owners to their wealth may be widely different in the two cases. The people of North Dakota and the people of New York would be insufficiently compared with each other in an important particular if we were to stop here. The relationship of the owners, as a mass, to their wealth, as a mass, has not yet been touched. North Dakota is poorer than New York; wealth is more abundant in New York, no matter whether owned by a smaller proportion of the people, nor whether more unequally distributed among its owners than in North Dakota. The general level of distribution is higher in New York than in the other state; there is more wealth in relation to the number of its owners.

It remains for the average to find the general level, or plane, of distribution. By no other course can the relation-

ship of mass to mass be represented comprehensively, nor by one number. The average amount of wealth possessed by each owner does not imply that anyone owns the average, nor that a majority, nor any considerable proportion of the owners individually, own wealth near the average in amount. These conclusions may be confirmed or denied analytically by a classification of owners according to the amount of their holdings. It is now necessary to avoid analysis altogether, and to grasp a generality in which rich and poor are individually lost to sight. Nothing but the average answers this purpose.

Since the preceding tables are purely illustrative, the average holdings and imaginary percentages of owners of population have been added merely to complete the formal statement.

Social groups may now be fully compared with one another in regard to distribution, except so far as analysis may be desired. In comparing two groups the statement may be that in one of them a larger proportion of the people own wealth, and that it is more evenly distributed among its owners on a higher plane of distribution. According to general belief, this would be giving to a community a most desired character in regard to the distribution of wealth. For comparative purposes the three descriptions of distribution become six; the proportion of the wealth owners in the population, and the evenness or inequality of the distribution of their wealth among them may be more or less, and the plane on which the distribution takes place may be higher or lower in one social group than in another, or at one time in the same social group than at another. These six comparative descriptions, always to be used in combinations of the three essentials, admit of eight combinations.

An application of this triple measure of distribution may be made to the ownership of government bonds, statistics of which were published by the United States Census of 1880.<sup>1</sup>

<sup>1</sup> Vol. VII, pp. 498-501.

Massachusetts and Maryland are selected for the following table as representing distinctly different results:—

TABLE III.

NUMBER AND AMOUNT OF FOUR, FOUR AND ONE-HALF, AND FIVE PER CENT REGISTERED GOVERNMENT BONDS OWNED IN MARYLAND AND MASSACHUSETTS IN 1880.

## MARYLAND.

Classification of Holdings.	Total.		For Males.		For Females.	
	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.
\$500 and under ...	227	\$70,700	111	\$33,250	116	\$37,450
550 to \$1,000....	189	173,800	110	101,050	79	72,750
1,050 to 2,500....	174	309,450	103	186,150	71	123,300
2,550 to 5,000....	122	471,100	82	316,750	40	154,350
5,050 to 10,000... .	98	797,300	60	503,800	38	293,500
10,050 to 25,000....	63	1,090,400	44	782,800	19	307,600
25,050 to 50,000....	27	1,011,250	17	632,550	10	378,700
Over \$50,000.....	20	3,065,600	15	2,389,300	5	726,300
Total.....	920	\$6,989,600	542	\$4,895,650	378	\$2,093,950

## MASSACHUSETTS.

\$500 and under ...	7,244	\$2,060,350	3,526	\$1,029,450	3,718	\$1,030,900
550 to \$1,000...	3,759	3,317,450	2,002	1,782,750	1,757	1,534,700
1,050 to 2,500....	2,784	4,888,650	1,540	2,725,050	1,244	2,163,600
2,550 to 5,000....	1,592	6,131,200	1,030	3,985,700	562	2,145,500
5,050 to 10,000....	814	6,311,950	553	4,278,600	261	2,033,350
10,050 to 25,000....	444	7,260,850	294	4,830,700	150	2,380,150
25,050 to 50,000....	137	6,026,800	117	4,561,400	20	1,465,400
Over \$50,000.....	81	9,141,500	73	8,504,200	8	637,300
Total.....	16,855	\$45,138,750	9,135	\$31,747,850	7,720	\$13,390,900

After treating these statistics in accordance with the method of measuring distribution described on the preceding pages, it appears that in Maryland 0.10 of 1 per cent of the total population, 0.12 of 1 per cent of the male population, and 0.08 of 1 per cent of the female population owned registered government bonds bearing the rates of interest mentioned in 1880; and that in Massachusetts 0.95 of 1 per cent of the total population, 1.06 per cent of the male population,

TABLE IV.  
MEASURES OF DISTRIBUTION OF GOVERNMENT BONDS.

Description.	Total.	For Males.	For Females.
MARYLAND — median for amount.....	\$39,411	\$45,719	\$28,872
"      "      " number.....	1,417	1,754	966
Difference.....	37,994	43,965	27,906
MASSACHUSETTS — median for amount.....	\$9,890	\$16,398	\$4,795
"      "      " number .....	692	784	586
Difference.....	9,198	15,614	4,209
MARYLAND—percentage of owners of population	0.10	0.12	0.08
MASSACHUSETTS " " " "	0.95	1.06	0.83
MARYLAND — average holding.....	\$7,597	\$9,033	\$5,540
MASSACHUSETTS " " .....	2,678	3,475	1,735

and 0.83 of 1 per cent of the female population owned bonds. The difference between the medians for total number of owners and amount of holdings in Maryland is \$37,994; for males, \$43,965; for females, \$27,906. The difference for the total in Massachusetts is \$9,198; for males, \$15,614; for females, \$4,209. The average holding in Maryland was \$7,597; for males, \$9,033; for females, \$5,540. In Massachusetts the average holding was \$2,678; for males, \$3,475; for females, \$1,735.

The sexes may now be compared thus: A larger proportion of the male population than of the female population owned bonds in each state; the distribution of the amount of the bonds was more unequal among the male owners in each state than among the female owners; and the general level, or plane, of the distribution in each state was higher among the males than among the females.

In comparing the states it may be said that much larger proportions of both male and female populations owned bonds in Massachusetts than in Maryland; that the distribution was much more even for each sex in Massachusetts than in Mary-

land; and that the plane of the distribution was much higher in Maryland than in Massachusetts for each sex.

It is admitted that the medians are not accurately placed in the preceding table, because the class of bond holders in which each median is placed (\$10,050 to \$25,000, for instance) may include holdings of too wide a range in amount, and because these holdings may be unequally distributed throughout the class. There may be more holdings of \$20,000 than of \$13,000, and, if this is so, the apparent place of a median in this class is not the true place. However, these errors are probably more or less of a related character, which diminishes their effect in a comparison of the medians, since in such case the errors must tend to cancel each other; and, besides, the difference between any two medians is probably too great to be accounted for entirely by an error due to the too limited classification employed by the Census Office. An error of this sort is the fault of the tables, of course, and not of the process adopted for measuring the inequality of distribution; the classification could have been made as minute as the holdings allow, and the matter is referred to for the purpose of pointing out the minuteness of the classification required by this process of arriving at the measure.

Extra Census Bulletin No. 18 publishes statistics showing the values of mortgaged farms and homes occupied by owners in 10 counties in Kansas and 10 counties in Ohio, and the distribution of these values may be measured by the scheme herein described. The classification of values is not minute enough to insure positive accuracy in computing the places of the medians, but is sufficiently minute to establish true comparisons among them as indicating relative evenness or inequality of distribution. The comparisons would probably be changed only in degree if the classification were minute enough to permit the location of the medians with precision.

The following comparisons of the distribution of the values of mortgaged farms and homes occupied by owners in the

TABLE V.

DISTRIBUTION OF THE VALUES OF MORTGAGED FARMS AND HOMES OCCUPIED BY OWNERS.

10 Kansas Counties.

Classification of Values.	For Farms.		For Homes.	
	Number of Families.	Value of Farms.	Number of Families.	Value of Homes.
Under \$100 .....	.....	.....	2	\$150
\$100 and under \$200 .....	3	\$445	13	1,842
200 and under 300 .....	7	1,535	28	6,185
300 and under 400 .....	16	5,120	55	17,320
400 and under 500 .....	28	11,340	86	35,125
500 and under 1,000 .....	252	183,363	577	390,675
1,000 and under 1,500 .....	601	690,606	444	491,925
1,500 and under 2,000 .....	861	1,390,611	305	484,266
2,000 and under 2,500 .....	968	2,001,848	199	405,850
2,500 and under 5,000 .....	3,244	10,819,498	453	1,424,664
5,000 and under 10,000 .....	1,224	7,670,806	158	989,150
10,000 and under 25,000 .....	321	4,224,200	63	869,100
25,000 and over .....	28	904,800	4	130,000
Total.....	7,553	\$27,904,172	2,387	\$5,246,252

10 Ohio Counties.

Under \$100 .....	1	\$98	9	\$520
\$100 and under \$200 .....	22	3,037	40	5,643
200 and under 300 .....	36	7,904	97	21,989
300 and under 400 .....	73	23,146	133	42,526
400 and under 500 .....	60	24,930	140	58,187
500 and under 1,000 .....	375	259,781	946	654,391
1,000 and under 1,500 .....	439	502,337	910	1,036,736
1,500 and under 2,000 .....	332	540,457	853	1,381,153
2,000 and under 2,500 .....	308	646,366	700	1,454,644
2,500 and under 5,000 .....	968	3,276,351	1,785	5,868,917
5,000 and under 10,000 .....	670	4,371,333	902	5,711,010
10,000 and under 25,000 .....	238	3,177,151	297	3,984,295
25,000 and over .....	21	799,124	42	1,485,960
Total.....	3,543	\$13,632,015	6,854	\$21,705,971

selected counties in these two states may now be made: The mortgaged farms in each state, as compared with the mortgaged homes, are owned by the larger proportion of the total farm families, owning and hiring; and in the Kansas counties by the larger proportion of the farm owning families, but by

TABLE VI.  
MEASURES OF DISTRIBUTION OF FARM AND HOME VALUES.

Description.	10 Kansas Counties.		10 Ohio Counties.	
	For Farms.	For Homes.	For Farms.	For Homes.
Median for amount.....	\$4,734	\$3,886	\$6,752	\$5,288
"    " number.....	3,802	1,487	2,824	2,214
Difference.....	1,432	2,399	3,929	3,074
Percentage of these families of total families reporting.....	42.98	21.29	12.78	6.62
Percentage of these families of total owning families reporting.....	64.38	41.19	20.32	21.82
Average value.....	\$3,694	\$2,198	\$3,848	\$3,167

the smaller proportion in the Ohio counties. In the Kansas counties the distribution of the farm values is more even than that of home values, but in the Ohio counties is more uneven. The general level of the distribution is higher for farms in both states.

A comparison of the states for farms discloses the fact that a much larger proportion of the total farm families occupy and own mortgaged farms in the Kansas counties than in the Ohio counties, and a much larger proportion, also, of the total farm owning families; and that the distribution of the values of owned and mortgaged farms among the owners is more even in Kansas than in Ohio, on a somewhat lower plane of distribution.

Families occupying owned and mortgaged homes are a larger proportion both of the total home families and of the total home owning families in Kansas than in Ohio; the distribution of the values of homes that are owned and mortgaged is more even in Kansas, and on a lower plane of distribution than in Ohio.

An application of the scheme to the measurement of the distribution of the salaries paid to the office employes of the Pension Office and of the Census Office is made in the fol-

lowing tables. The number of persons drawing each rate of annual compensation is found in the Register of the Department of the Interior for 1891. The total amount of the compensation of each class is obtained by multiplying the number of persons in the class by the rate. It would be better to have actual salary earnings instead of these estimated earnings based on salary rates; but, as a matter of fact, the estimates are close to the true earnings for one year from the summer of 1890 to the summer of 1891, during which time the number of persons in each class changed but little.

TABLE VII.  
DISTRIBUTION OF SALARIES IN THE PENSION OFFICE AND IN THE CENSUS OFFICE.

Classification of Salaries.	Pension Office.		Census Office.	
	Number of Employes.	Amount of Salaries.	Number of Employes.	Amount of Salaries.
\$240	13	\$3,120	57	\$13,680
400	25	10,000	22	8,800
600	....	.....	263	157,800
660	24	15,840	....	.....
720	35	25,200	525	378,000
750	3	2,250	....	.....
840	30	25,200	3	2,520
900	186	167,400	755	679,500
1,000	336	336,000	311	311,000
1,200	458	549,600	158	189,600
1,400	524	733,600	29	40,600
1,600	98	156,800	19	30,400
1,800	126	226,800	9	16,200
1,825	....	.....	1	1,825
2,000	173	346,000	10	20,000
2,190	....	.....	15	32,850
2,250	2	4,500	....	.....
2,500	....	.....	2	5,000
3,000	1	3,000	....	.....
3,600	2	7,200	....	.....
5,000	1	5,000	....	.....
6,000	....	.....	1	6,000
Total .....	2,037	\$2,617,510	2,180	\$1,893,775

The distribution of salary earnings was more uneven in the Pension Office than in the Census Office, and was remark-

TABLE VIII.  
MEASURES OF DISTRIBUTION OF SALARIES.

Description.	Pension Office.	Census Office.
Median for amount.....	\$1,400.24	\$900.57
"    " number .....	1,200.80	900.29
Difference.....	199.44	0.28
Average salary.....	\$1,285	\$869

ably even in the latter, the medians for number and amount being found in the same class,—that of employes receiving \$900; but the plane of distribution was much lower in the Census Office, the average salary in this office being \$869, and the average in the Pension Office being \$1,285.

It may not be impossible to obtain the required facts in regard to the ownership of wealth, the distribution of which could be measured by the foregoing scheme. Some sort of accurate measure must be employed if it is ever to be determined satisfactorily whether "the rich are growing richer and the poor poorer," or whether the rich are growing richer faster than the poor are, unless the difference in distribution between two dates is so marked that the tendency may be indicated by means of percentages. The scheme herein outlined is suitable for this purpose, it is believed, and is applicable to the measurement of the distribution of the values of real estate, of wage earnings, of cattle, of the shares of corporations, etc., so that comparisons may be established between dates, and among various social groups, with the finest precision.

The belief prevails that the society containing the larger proportion of middle class wealth owners is the more healthy and promising society, other conditions being the same. It is desired that the great mass of the people shall enjoy a high degree of comfort, if not of luxury also; that wealth shall not only be widely diffused among the members of society,

but generously diffused, so that welfare shall be the possession of the masses. The highest welfare of this character does not require the predominance of the middle class, because it is mathematically demonstrable that, other things being equal, social welfare, to the extent that it is derived from wealth, is greater in proportion as the middle class predominates over the poorer class, and the richer class over the middle class; and that the type of distribution next to be desired is that in which the middle class of wealth owners predominates the more over co-equal poorer and richer classes.